

CLAIMS:

1. A fine channel device comprising at least one fluid inlet port for introducing at least one fluid, at least one fine channel for performing a chemical treatment of  
5 the fluid or for producing fine particles from the fluid, and at least one fluid outlet port for discharging at least one fluid applied with the chemical treatment or at least one fluid containing the fine particles produced;

wherein:

10 the fine channel device is constituted by at least one fluid supply device for supplying the fluid into the fine channel and at least one fine channel substrate having the fine channel;

the fluid supply device comprises at least one  
15 perforated opening as a fluid inlet port for introducing the fluid, a storage space for temporarily storing the introduced fluid which is communicated with the fluid inlet port, and at least one supply channel of linear and/or curved form, formed in a radial direction, which  
20 is communicated with each of the fluid inlet ports of at least one fine channel formed in the fine channel substrate to supply the fluid from the storage space to the fine channel; and

said at least one fluid supply device has at least  
25 one perforated opening formed in the fluid supply device, and the perforated opening communicates with each of the fluid outlet ports of the at least one fine channel in

the fine channel substrate, the perforated opening being used as a fluid outlet port for discharging the fluid.

2. The fine channel device according to Claim 1, wherein at least one introduced fluid can be introduced  
5 from the storage space of the fluid supply device into the fluid inlet port of the fine channel substrate having the fine channel independently.

3. The fine channel device according to Claim 2, wherein supply channels of the at least two fluid supply  
10 devices are disposed so as not to overlap with supply channels of other fluid supply devices.

4. The fine channel device according to any one of Claims 1 to 3, which is constituted by piling-up at least two fine channel substrates having a fine channel for  
15 performing a chemical treatment or producing fine particles from a fluid, wherein each fluid inlet port for the fine channel is communicated with any one of the supply channels of the fluid supply device.

5. The fine channel device according to any one of  
20 Claims 1 to 4, wherein the shape of the storage space is a circular recess.

6. The fine channel device according to any one of Claims 1 to 4, wherein the shape of the storage space is a polygonal recess.

25 7. A desksize chemical plant comprising a plurality of the fine channel devices each defined in Claim 1,

means for supplying at least one fluid to the plurality of fine channel devices, and

means for recovering products produced by the chemical treatment for the fluid or fine particles formed  
5 from the fluid.

8. The desksize chemical plant according to Claim 7, wherein the means for supplying the fluid is of a pressure-driven type, and the desksize chemical plant further comprises means for degassing liquid to be  
10 supplied to the fine channel device.

9 The desksize chemical plant according to Claim 7 or 8, which further comprises a distributor for supplying the fluid to the fine channel device, and a collector for recovering the fine particles formed in the fine channel  
15 device.

10. The desksize chemical plant according to any one of Claims 7 to 9, which further comprises means for adjusting the fluid pressure produced in the fine channel device.

20 11. The desksize chemical plant according to any one of Claims 7 to 10, which further comprises a mechanism for flowing a fluid in the regular or the reverse direction as means for cleaning the fine channel device.

12. The desksize chemical plant according to any one of  
25 Claims 7 to 11, which further comprises means for supplying a gas for drying the fine channel constituting the fine channel device.

13. The desksize chemical plant according to any one of Claims 7 to 12, which further comprises means for automatically supplying raw materials for performing a chemical treatment or for producing fine particles to tanks for storing them, and means for automatically feeding products produced by the chemical treatment or fine particles produced from tanks for recovering them.

14. The desksize chemical plant according to any one of Claims 7 to 13, which further comprises:

10       a tank for temporarily storing the raw material discharged from the fine channels other than the products in order to reuse at least one of the raw materials for performing the chemical treatment or for producing the fine particles; and

15       means for recovering the raw materials to be reused from the above tank to the tank for storing the raw material.

15. The desksize chemical plant according to any one of Claims 7 to 14, which further comprises means for separating only the raw material to be reused from the raw material containing other raw materials and/or products of the chemical treatment or the fine particles produced.

16. The desksize chemical plant according to any one of Claims 7 to 15, which further comprises:

25       a tank for storing fluid to be supplied to the fine channel device;

a tank for recovering products produced by performing the chemical treatment or fine particles produced; and

means for controlling the temperature of the above  
5 tanks and the fine channel device.

17. The desksize chemical plant according to any one of Claims 7 to 16, which further comprises:

a plurality of valves for adjusting the quantity of the fluid supplied when the fluid is supplied to the fine  
10 channel device, the plurality of valves being for adjusting the supply rate of the fluid to be a predetermined supply rate.

18. The desksize chemical plant according to any one of Claims 7 to 17, which further comprises automatically  
15 controllable means used in at least one process selected from the group consisting of supplying fluid to the fine channel device, recovering products produced by the chemical treatment or fine particles produced in the fine channel device, washing the fine channel device and  
20 drying the fine channel device.

19. A fine particle producing apparatus which is the desksize chemical plant as defined in any one of Claims 7 to 18, further comprising

means for supplying at least one fluid for producing  
25 fine particles to the fine channel device as defined in any one of Claims 1 to 6, and

means for recovering the fine particles produced in

the fine channel device.

20. The fine particle producing apparatus according to Claim 19, wherein the fluids for producing fine particles comprises a liquid containing a raw material for

5 producing gel, and a liquid containing a dispersing agent for producing gel.

21. The fine particle producing apparatus according to Claim 19 or 20, wherein the fine channel constituting the fine channel device has a Y-shape so that a dispersion

10 phase and a continuous phase introduced from the respective inlet ports of the fine channel device are confluent in the fine channel to produce fine particles.

22. The fine particle producing apparatus according to Claim 21, wherein the angle at which the channel for

15 introducing the dispersion phase crosses the channel for introducing the continuous phase is adjusted to control the size of fine particles produced.